Rocky Mountain Geographic Science Center

DOI Fire Science Thrust - Colorado Pilot

Background

Wildfires continue to put pressure on planning and mitigation efforts at federal, state and local levels --especially in the

Wildland-Urban Interface (WUI). A key aspect to combating these hazards is the ability to map fire fuels and associated risks at the local level. In FY04, the Rocky Mountain Mapping Geographic Science Center (RMGSC) began research on vegetation stand delineation and fire fuels mapping.

The Front Range Fire Fuels Mapping project has focused on the development of high-resolution mapping techniques for fire fuels and associated risks. The fusion of advanced image classification techniques with readily available high-resolution data provides cost-effective and accurate inventories of fire fuels and other hazards in the WUI. Activities were expanded in FY05 with the objective of delineating stands of similar vegetation

-- analogous to the Forest Service's Common Vegetation Units (CVUs)

-- along the Front Range of Colorado, and other areas including Wyoming and Texas, using satellite imagery.

Data sources include Landsat, ASTER, QuickBird, and NAIP imagery.

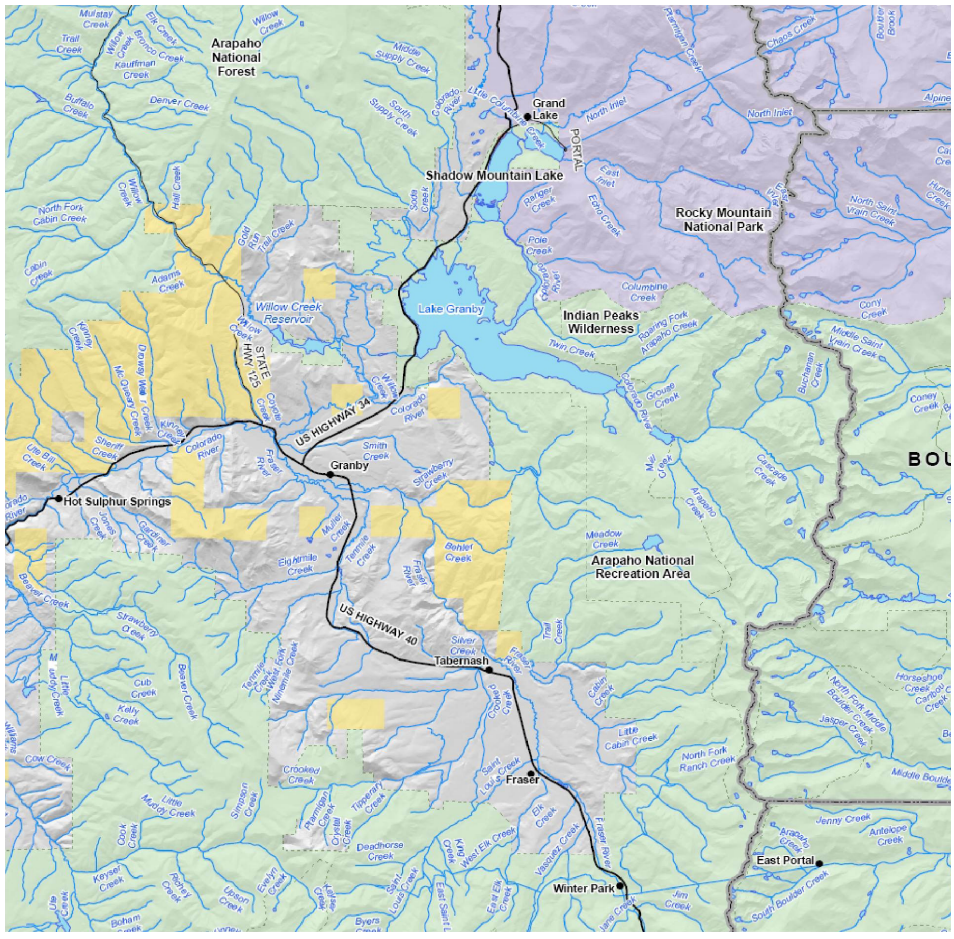
The FY06 DOI Science Thrust Fire Science Initiative will expand this effort and address the needs of Federal, State, and local agencies to manage wildfires and their associated hazards and to mitigate impacts on people, property, and natural resources. This effort will involve designing monitoring strategies, providing assistance and tools for restoration, and addressing other multi-agency research priorities.

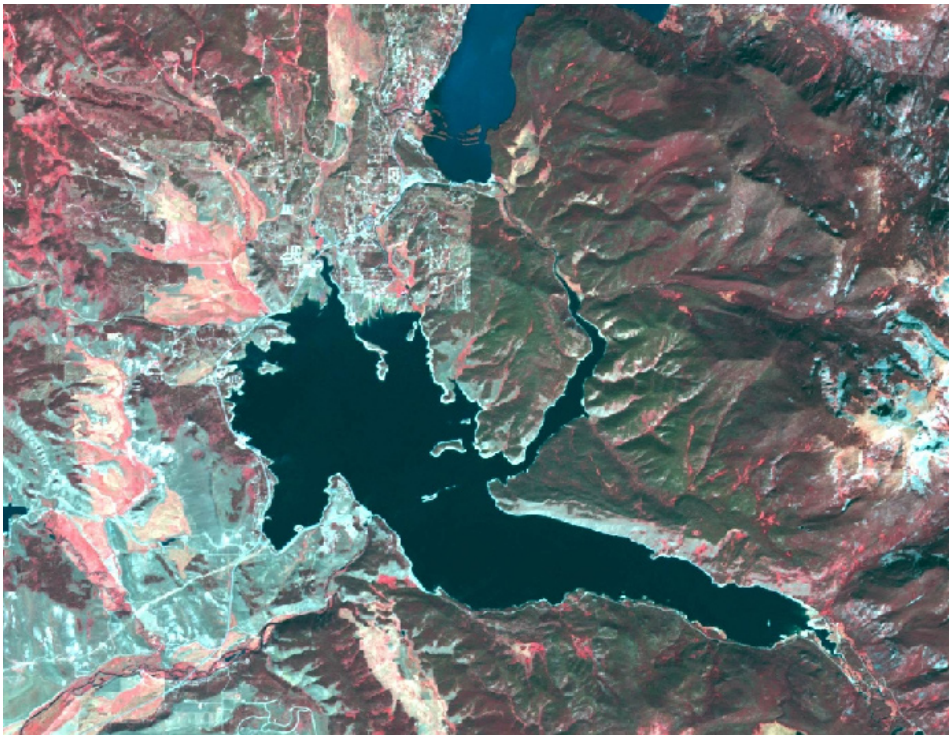
Among the products anticipated from this effort in FY06 are:

- A series of USGS fire science fact sheets
- A pilot effort focused on high-risk wildland-urban interface (WUI) zones in Grand County, Colorado
- An initial hazards assessment of potential impacts on the Three Lakes watersheds in Grand County
- Fuels models and stand delineation maps of impacted communities

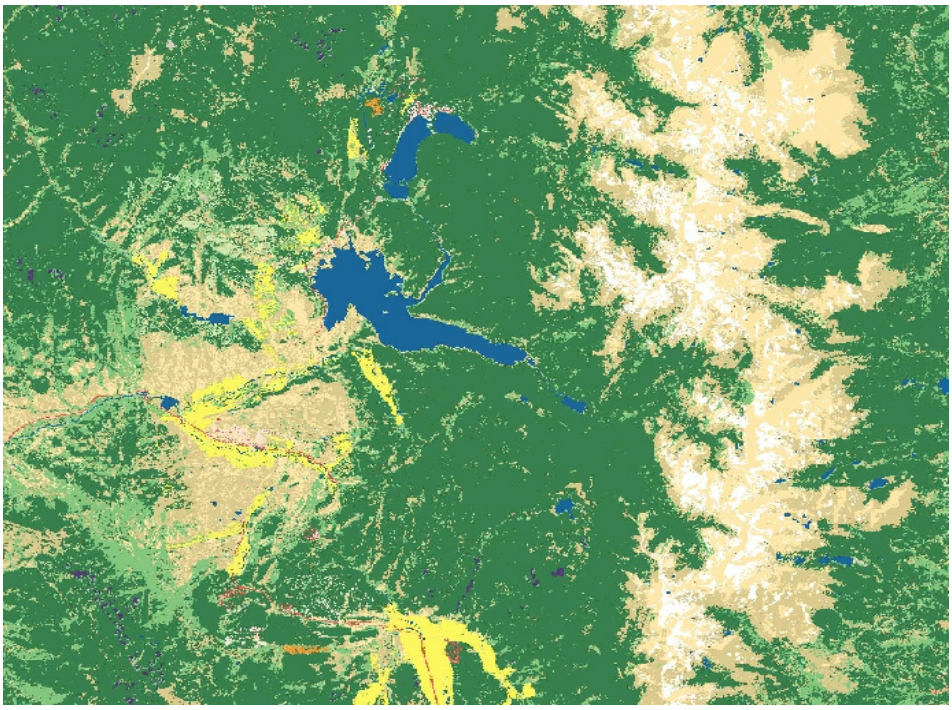
Objectives

For the Front Range Pilot the USGS will work in collaboration with the local WUI communities, fire departments, State and Local officials in Grand County, Colorado, and other Federal agencies to assess natural hazards risks. The best available information, including medium- and high-resolution imagery and elevation data, will be used to evaluate potential





wildfire impacts on the WUI and the associated watersheds. The spatial and temporal aspects of a hazard and the potential for interaction among hazards will be evaluated. Specific to the wildland fire hazard other aspects will be examined, including: fuel loading, impacts and effectiveness of fuel treatments, pre-event long-term climatic conditions and rainfall regime (mote technology), and potential resources at risk.



A pre-fire assessment of the potential effects on life and property from post-fire flooding, landslides, and erosion will be performed. The USGS will investigate adverse effects on surface and subsurface water quality and availability in the Three Lakes watershed and the Colorado-Big Thompson trans-mountain diversion, develop criteria for prioritization of fuel treatments and incident response, and determine effective post-fire rehabilitation treatments. Scientific contributions will help answer questions about the costs and benefits of a range of fuel treatments, incident response and post-fire rehabilitation techniques applied to the landscape.

FY06 Planned Activities

In FY06, RMGSC will collaborate with state and federal partners on the product format and information from the stand delineation and fuels mapping activities to assess natural hazards risks and assess pre-fire conditions. Fuels models characteristics discussions will take place with collaborators to determine what other processes or information can be used to ascertain fuels and land management information.

Research will be performed on alternative sources of data, both existing high resolution data and lower resolution sources based on availability and partner needs. In addition, sensors, software and processing techniques will be evaluated for fuels mapping including evaluating needs given a specific area, fuels models available for specific cover types, and various image processing and statistical software for classification. Ultimately, the best available remotely sensed data will be incorporated into the mapping process and applied to an integrated science approach to examine all potential natural hazards expected to WUI areas. Finally, RMGSC will work with WUI communities to provide them the ability to maintain the risk assessments and associated predictive models.

For more information:

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